AAP Ask the Experts Panel:
Transfer of Care and Handoffs

Society for Pediatric Anesthesia
Jamie McElrath Schwartz, MD, FAAP
March 7, 2014
Conflict of Interest

No Disclosures
Objectives

1. List critical elements of different handoffs that occur in the perioperative setting.

2. Describe the importance of handoff communication in continuity of care and patient safety; list frequent deficiencies.

3. Discuss tools for implementing a formalized handoff process in perioperative settings.
Handoff Defined

“the exchange between health professionals of information, about a patient accompanying either a transfer of control over, or responsibility for, the patient.”

Qual Saf Heath Care 2010;19:493-7
Handoff Focus: A Mandate

Joint Commission National Patient Safety Goal 02.05.01: “implement a standardized approach to ‘handoff’ communications”

ACGME Handoff Education: requirement for competency in handoffs

British and Australian Medical Association “Safe Handover: safe patients” 2005, 2006

Joint Commission National Pt Safety Goals 2006
Australian Med Assoc. 2006
British Medical Assoc. 2005
AGENDA

Intraoperative Handoffs

Postoperative Handoffs with emphasis on ICU Transition of Care

Questions and Discussion
Intraoperative Handoffs - Unique Challenges and Opportunities

- Complex environment
- Situational awareness & inattentional blindness
- Noise/Lighting not optimal
- Variable times of day
- May happen distant from patient
- Multi-level provider handovers

- Some uniformity of practice
- Predictable course of procedure
- Opportunity for error detection
Handoffs may have favorable affect on care.

“...we suggest a defined protocol...whenever personnel change occurs.”
Handoff Opinions and Practice

• 10% of experienced anesthetists reported using guidelines for handoffs of anesthetized patients
• Majority reported concerns of accountability and defensibility around handoffs
• “Formalization” would be valuable

• 84% of surveyed had given a ‘poor’ handoff in previous year
• 25% related an adverse event associated with a poor handoff

Anesthesia 2004;59:658-63
Oschner Jour 2011;11:99-101
Intraoperative Handoff Tool Pilot Study: Background

• 2010 SPA Quality and Safety Committee effort
• Multi-institutional expert consensus to develop intraoperative handoff tool
• Pilot implementation and study

Hypothesis: Tool use would
• not be prohibitively time consuming
• lead to discovery of information
• be rated as useful by participants.
TOOL EVALUATION:
The Tool was used as handoff for (circle one):

Break (not finishing case)  Break (finishing case)  Transfer of Care

The Intraoperative Handoff tool took _____ minutes and _____ seconds to use.

Was useful information discovered by using the Handoff Tool?  Yes / No

This tool was overall (circle one):

Very Useful  Somewhat Useful  Undecided  Not Very Useful  Not at All Useful

Suggestions for improvement:
Intraoperative Handoff Tool Pilot Study: Methods

• Non-consecutive, convenience sample of handoffs
• Handoff tool was used and then evaluation form completed
• Handoff types:
  – Break
  – Transfer of Care

End Points:
  – Time (seconds)
  – Discovery of information (Y/N)
  – Likert Scale of usefulness
Intraoperative Handoff Tool Pilot Study: Results

231 measurements

n=228

3 excluded

94 Break
66 not classified
68 Transfer

6 institutions participated over a 6 month period:
Chicago, Children’s Hospital of Philadelphia, Columbia, Johns Hopkins, Seattle Children’s, Texas Children’s Hospital
Intraoperative Handoff Tool Pilot Study: Results

Handoff Median Time

- Break: 120 seconds
- Transfer: 132.5 seconds

No difference in median time for break vs. transfer
Intraoperative Handoff Tool Pilot Study: Results

64% of evaluations reported that useful information was discovered when using structured Handoff Tool.
Intraoperative Handoff Tool Pilot Study: Results

Average Likert Scale by Location

- Location 1: 4.3
- Location 2: 3.5
- Location 3: 4.3
- Location 4: 3.0
- Location 5: 3.7
- Total: 3.9

Higher Likert scale associated with info. discovery, p<0.0001

Likert scale associated with location p<0.001

Average Likert all locations = 3.9
“undecided - somewhat useful”
Intraoperative Handoff Tool Pilot Study: Conclusions

- Standard handoff tool was feasible
- Information was discovered in majority of handoffs
- Evaluators found the tool to be of uncertain usefulness
- Assessment as useful was associated with discovery of information and location

Acknowledge SPA Safety and Quality Committee Collaborators
Sam Baxter for database management, Mike Spaeder for analysis
Checklists to improve care?

Implementing checklists in the operating room

Daniel Low1, Isabeau Walker2 & Eugenie S. Heitmillerr3

1 Seattle Children’s Hospital, University of Washington, Seattle, WA, USA
2 Great Ormond Street Hospital NHS Foundation Trust, London, UK
3 Johns Hopkins University School of Medicine, Baltimore, MD, USA

Handoff checklists improve the reliability of patient handoffs in the operating room and postanesthesia care unit

Anne C. Boat & James P. Spaeth
Department of Anesthesia, Cincinnati Children’s Hospital Medical Center, Cincinnati, OH, USA

Ped Anes 2012;22:1025-31
Ped Anes 2013;23:647-54
Why are Physicians Resistant to Checklists?

- Cultural bias against standardization
- Creativity and improvisation is valued
- Subtle snobbery of ‘medicine as an art’
- Complexity of information
- Situational nature of communication

*Ann Am Thorac Soc* 2013: Dec 16 {epub ahead of print}
Knowledge at Wharton: Management.
*Adv in Health Care Mngmt* 2011;11:91-132
Checklists for Handoff: not the whole story?

- Critical information to be transmitted in handoff is more nuanced than most tools
- Shared mental model vs. raw data
Conclusions

Intraoperative Handoffs:
- a critical part of anesthesia
- generally unstructured
- require microcosm and macrocosm information sharing
- checklists and documentation are part of the solution
OR to ICU Handoffs:

AAP Ask the Experts Panel
Society for Pediatric Anesthesia Winter Meeting
Thomas Taghon, DO
March 7, 2014
OR to ICU Handoff

Conflicts of Interest:

• None
OR to ICU Handoff

Failures

Ong & Coiera (2011)

• Systematic review of handoff failures in literature from 1980-2010.
• Identified 6 papers specifically related to surgical patients.
• Made recommendations for handoff of surgical patients based on their findings.

## Post-Operative Handoff Failures

<table>
<thead>
<tr>
<th>Author</th>
<th>Method</th>
<th>Findings</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anwari et al., 2002</td>
<td>Questionnaire: OR to PACU</td>
<td>Poor Quality, Critical information missing</td>
<td>Critical information should be verbally communicated, Anesthesia should stay until first vital signs obtained.</td>
</tr>
<tr>
<td>Greenberg et al., 2007</td>
<td>Analysis of Malpractice Claims in surgical patients</td>
<td>32% of claims involved post-operative communication failure</td>
<td>Standardize handoff protocols, define trigger events that mandate communication.</td>
</tr>
<tr>
<td>Nagpal et al., 2010</td>
<td>Interviews of staff involved in OR to PACU communication.</td>
<td>Handoff fragmented and incomplete. Surgical team often absent.</td>
<td>Standardized protocol for handoff.</td>
</tr>
<tr>
<td>Nagpal et al., 2010</td>
<td>Observational study</td>
<td>Inadequate handoff. Mostly verbal communication.</td>
<td>Add written content to handoff.</td>
</tr>
<tr>
<td>Nagpal et al., 2010</td>
<td>HFMEA</td>
<td>Inadequate post-operative handoff was most important failure mode.</td>
<td>Implementation of a handoff check-list.</td>
</tr>
<tr>
<td>Smith et. al., 2008</td>
<td>Interviews, observations</td>
<td>Communication problems related to unpredictable environment and staffing during handoff.</td>
<td>Standardize Handoff Protocol</td>
</tr>
</tbody>
</table>

Adapted from: Ong, M., Coiera, E. (2011). The Joint Commission J.on Qual. And Pat. Safety. 37(6); 274-84.
## Post-Operative Handoff Failures

<table>
<thead>
<tr>
<th>Key Challenges</th>
<th>Improvement Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal, unstructured handoffs with missing information</td>
<td>Standardize handoff procedures and content.</td>
</tr>
<tr>
<td>Surgeons handoff lacking, or missing information</td>
<td>Multidisciplinary team handoffs.</td>
</tr>
<tr>
<td>Environment in PACU (ICU) not conducive to good communication</td>
<td>Initiate a formal handoff procedure in which interruptions are minimized.</td>
</tr>
</tbody>
</table>

Adapted from: Ong, M., Coiera, E. (2011). The Joint Commission J.on Qual. And Pat. Safety. 37(6); 274-84
**AIM**

Develop and implement a 5-P template hand-off communication for direct OR to NICU/PICU/CTICU patient transfers by June 1, 2010. Achieve 70% compliance for October through December, 2010.

**Key Drivers**

- Defined OR Team (by title) that will accompany patient to the ICU
- Defined ICU Team (by title) that will receive the patient in ICU
- Standardized information that will be gathered about the patient and communicated
- 5P handoff list

**Design Changes/Interventions**

- Require certain key caregivers be present at each patient transfer.
- Require certain key caregivers be present at each patient transfer.
- Review and develop key information that must be reviewed for each handoff.
- Develop a paper handoff tool for OR to PICU/NICU. Modify current paper handoff tool for OR to CICU. Develop an RN Verbal Handoff template.
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OR to ICU Handoff Team

Who needs to be present?
Different for each ICU
Coverage unique to each unit
Attending? Fellow? APN?
RN
RT
Anesthesia Team
Attending
CRNA/Fellow/Resident
Surgical Team
Attending?
Fellow/Resident
OR RN?
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OR to PICU/NICU Sign Out

Present (OR Team):
- Surgeon or Fellow or Involved Res
- Anesthesiologist
- CRNA/SRNA or Fellow

Present (PICU):
- Attending or Fellow
- Nurse
- RT
- Resident/APN (if assigned to case)

Present (NICU):
- Attending or Fellow or NNP
- Nurse
- RT
- Resident (if assigned to case)

Are we ready for hand off? (Name Game, Anes, ICU med team, ICU Nursing, Resp therapy, Room Silence)

- Family/Social Issues:
- Plan:

AIRWAY/RESPIRATORY
- Easy / Difficult / Critical
- ETT Size
- Depth cm
- Laryngoscope
- If Critical, why?
- Ventilator Setting
- PIP
- PEEP
- Rate
- FiO2
- Baseline SpO2
- Most recent SpO2
- Intraoperative ABG pH
- pCO2
- PaO2
- HCO3
- @time:

CARDIOVASCULAR
- Access:
- PIV
- Arterial Catheter
- Central Cath
- ECG Rhythm
- Inotropic Support
- None
- Dopamine mcg/kg/min
- Dobutamine mcg/kg/min
- Epinephrine mcg/kg/min

NEUROLOGIC
- Medications & Last Dose
- Pre Operative Mental Status:

RENAL
- Intraoperative Chemistries
- Na
- K
- iCa
- Glucose
- @time:

HEMATOLOGIC
- Intraoperative
- Hgb
- Hct
- @time:
- Blood Products Given
- RBC ml
- Plts
- FFP
- Cryo
- Cell Saver

ID
- Antibiotics
- Last Dose:
- Temp
- Isolation:
- Type:

SURGICAL CONCERNS
- Drains/Tubes:

Completed by: __________ Date/Time: __________
**Specific Aim**

Achieve collection of 5P hand-off sheets for 95% of applicable OR to ICU patient transfers by June 1, 2011 & sustain this level of compliance throughout the remainder of year.

**Key Drivers**

- Consistent placement of the completed sheets
- Defined process for completing and placing sheets
- Process ownership

**Design Changes/Interventions**

- Change OR to NICU/PICU from to include "Do not place in patient's chart"
- Process flow map of 5P sheet in each ICU
- Add education concerning OR to ICU handoff requirements to orientation material in NICU, PICU and Anesthesiology
- PICU - give ownership of collecting and placing sheets to charge nurses
- Engage leadership in ICUs to state importance of proper handoffs to their staff
- Add 5P compliance metric to ICU reporting mechanisms
Measuring Quality of Handoffs

Assessing the quality of patient handoffs at care transitions

Tanja Marsler, Simon Foster, Stefan Gisin, Dalit Jaekel, Wolfgang Urmenhofer

ABSTRACT

Background: Effective handoff practices (e.g., mechanisms for transferring information, responsibility and authority) are critical to ensure continuity of care and patient safety.

Objective: This study aimed to develop a rating tool (self-assessment and external rating) for handoff quality that goes beyond mere information transfer.

Methods: The rating tool was piloted during 125 patient handovers in three different clinical settings in a tertiary care hospital: (1) inpatient to emergency room staff, (2) anesthesiology care provider to postanesthesia care unit (PACU) and (3) PACU nurse to ward nurse.

Results: We identified three factors (information transfer, shared understanding, working atmosphere) impacting handoff quality.

Conclusion: This study provides insights into the multidimensional concept of handoff quality. Our rating tool is feasible and can contribute to the identification not only of characteristics of the process but also of aspects of teamwork and, thus, provides an important tool for future research on patient handover.

INTRODUCTION

Patient handoff as a critical area for patient safety

The work of healthcare teams is distributed over time and location requiring them to employ effective handoff practices. This involves coordination and continuity of care, especially at care transition points and during shift changes. Adequate handoff has been defined as a mechanism for transferring information, primary responsibility, and authority that should ideally be a moment of shared cognition or some degree of overlap between healthcare providers. Contributions to informational, relational and management continuity in patient safety. However, the causes of many adverse events in healthcare can be traced back to inadequate handoffs.

There has been an increasing recognition that a lack of training on teamwork and effective communication contributes to a lack of formal handoff systems imposing the good practice necessary to maintain high standards of care in all areas of healthcare. Thus, patient handover is considered a priority for human factors research aiming at improved patient safety.

Studied on patient handoff

Research on patient handoff is mostly descriptive. Studies show, for example, that written documentation is rarely used to support care transitions and that interruptions during handoff are frequent.

METHODS

Study aim

Our study aimed to develop and test a rating tool for the quality of patient handoff at care transitions that can be used (1) in a variety of clinical settings and (2) for self-assessment by the clinicians involved in the handoff and for assessment by an external observer. Building on conceptual considerations and empirical evidence on patient handoff, we framed patient handoff as an episode of team work that involves more than just information transfer.

Our main research question was: what constitutes a safe and effective handoff (i.e., which handoff characteristics predict overall handoff quality)?
Table 1  Items of the rating tool for handoff quality

<table>
<thead>
<tr>
<th>Item no</th>
<th>Items per item category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Handoff followed a logical structure</td>
</tr>
<tr>
<td>2</td>
<td>The person handing off the patient continuously used the available documentation (anaesthesia record, patient chart, etc) to structure the handoff</td>
</tr>
<tr>
<td>3R</td>
<td>Not enough time was allowed for the handoff</td>
</tr>
<tr>
<td>4</td>
<td>In case of interruptions during handoff, attempts were made to minimise them</td>
</tr>
<tr>
<td>5</td>
<td>All relevant information was selected and communicated</td>
</tr>
<tr>
<td>6</td>
<td>Priorities for further treatment were addressed</td>
</tr>
<tr>
<td>7</td>
<td>The person handing off the patient clearly communicated her/his assessment of the patient</td>
</tr>
<tr>
<td>8</td>
<td>Possible risks and complications were discussed</td>
</tr>
<tr>
<td>9</td>
<td>It was easy to establish good contact at the beginning to the handoff</td>
</tr>
<tr>
<td>10R</td>
<td>There was tension within the team during handoff</td>
</tr>
<tr>
<td>11</td>
<td>Questions and ambiguities were resolved (active enquiry by the person taking on responsibility for the patient)</td>
</tr>
<tr>
<td>12</td>
<td>The team jointly ensured that the handoff was complete</td>
</tr>
<tr>
<td>13</td>
<td>Documentation was complete</td>
</tr>
<tr>
<td>14</td>
<td>There was too much information given</td>
</tr>
<tr>
<td>15</td>
<td>Too much information was asked for</td>
</tr>
<tr>
<td>16</td>
<td>The patient’s experience was considered carefully during handoff (respect)</td>
</tr>
<tr>
<td>17</td>
<td>Overall, the quality of this handoff was very high</td>
</tr>
<tr>
<td>18</td>
<td>The person handing off the patient was under time pressure</td>
</tr>
<tr>
<td>19</td>
<td>The person taking on responsibility for the patient was under time pressure</td>
</tr>
</tbody>
</table>
Quality of Handoff Audit Component Compliance

Chart Type: p-Chart

Component Compliance of Each Handoff

Dates

<table>
<thead>
<tr>
<th>Observation Compliance</th>
<th>Baseline Mean(s)</th>
<th>Baseline Period</th>
<th>Control Limits</th>
<th>Goal (None)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Compliant Audits</th>
<th>Total Audits</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
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</tbody>
</table>
So, we can measure process data, but what about outcomes........
Rates of Medical Errors and Preventable Adverse Events Among Hospitalized Children Following Implementation of a Resident Handoff Bundle

Amy J. Starmer, MD, MPH; Theodore C. Sectish, MD; Dennis W. Simon, MD; Carol Keohane, RN; Maireade E. McSweeney, MD, MPH; Erica Y. Chung, MD; Catherine S. Yoon, MS; Stuart R. Lipsitz, PhD;

Table 2. Incidence of Harmful and Nonharmful Medical Errors

<table>
<thead>
<tr>
<th>Error Type</th>
<th>Total No. of Errors (Rate per 100 Admissions) [95% CI]</th>
<th>Before vs After Intervention, Both Units</th>
<th>Before vs After Intervention, Unit 1</th>
<th>Before vs After Intervention, Unit 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before (n = 642 Admissions)</td>
<td>After (n = 613 Admissions)</td>
<td>P Value</td>
<td>Before (n = 363 Admissions)</td>
</tr>
<tr>
<td>Total errors</td>
<td>217 (33.8) [27.3-40.3]</td>
<td>112 (18.3) [14.7-21.9]</td>
<td>&lt;.001</td>
<td>100 (27.5) [19.0-36.1]</td>
</tr>
<tr>
<td>Preventable adverse events</td>
<td>21 (3.3) [1.7-4.8]</td>
<td>9 (1.5) [0.5-2.4]</td>
<td>.04</td>
<td>9 (2.5) [0.5-4.4]</td>
</tr>
<tr>
<td>Nonintercepted potential adverse events</td>
<td>47 (7.3) [5.0-9.6]</td>
<td>20 (3.3) [1.9-4.7]</td>
<td>.002</td>
<td>23 (6.3) [3.2-9.5]</td>
</tr>
<tr>
<td>Intercepted potential adverse events</td>
<td>96 (15.0) [11.2-18.7]</td>
<td>51 (8.3) [6.0-10.7]</td>
<td>&lt;.001</td>
<td>43 (11.8) [7.3-16.4]</td>
</tr>
<tr>
<td>Errors with little or no potential for harm</td>
<td>53 (8.3) [5.4-11.1]</td>
<td>32 (5.2) [3.3-7.2]</td>
<td>.04</td>
<td>25 (6.9) [3.8-10.0]</td>
</tr>
</tbody>
</table>

a The unit 1 intervention consisted of a resident handoff bundle that included a computerized handoff tool.  
b The unit 2 intervention consisted of a resident handoff bundle that did not include a computerized handoff tool.
Cultural Barriers at NCH

• Check List Utilization.
• Standardized Handoff Routine.
• Bedside RN Buy-In.
• Reverse Handoff- ICU to OR.